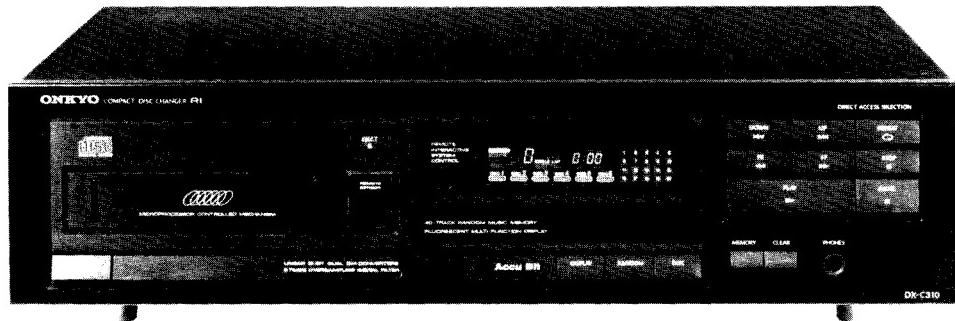


# ONKYO® SERVICE MANUAL

## COMPACT DISC AUTOMATIC CHANGER MODEL DX-C310



UD, UDN	120V AC, 60Hz
UU	110/120/220/240V AC, 50/60Hz
UQA	240V AC, 50Hz

### SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

### SPECIFICATIONS

Signal readout system:	Optical non-contact
Reading rotation:	About 500~200 r.p.m. (constant linear velocity)
Linear velocity:	1.2~1.4m/s
Error correction system:	Cross interleave readsolomon code
Decoded bits:	18 bits linear
Sampling frequency:	352.8kHz (eight-times oversampling)
Number of channels:	2 (stereo)
Frequency response:	5Hz~20kHz
Total harmonic distortion:	0.004% (at 1kHz)
Dynamic range:	98dB
Signal to noise ratio:	105dB
Channel separation:	100dB (at 1kHz)
Wow and Flutter:	Below threshold of measurability
Power consumption:	13 watts
Output level:	2 volts r.m.s.
Dimensions (W×H×D):	435×119×361mm 17-1/8"×4-2/3"×14-1/4"
Weight:	5.8kg, 12.8 lbs.

Specifications are subject to change without notice.

**ONKYO**  
**AUDIO COMPONENTS**

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## SERVICE PROCEDURES

### 1. Safety-check out

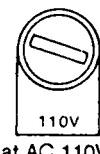
After correcting the original service problem, perform the following safety check before releasing the set to the customer:

Connect the insulating-resistance tester between the plug of power supply cable and chassis.

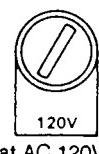
Specifications: more than 10Mohm at 500V.

### 2. Voltage selector (rear panel)

Worldwide models are equipped with a voltage selector to conform with local power supplies. Be sure to set this selector to match the voltage of the power supply in your area before turning the power switch on. Voltage is changed by turning the voltage selector with a screwdriver or similar instrument to the 110V, 120V, 220V or 240V position. Confirm that the selector has been set to the correct position before turning the power switch on. If there is no voltage selector switch on the unit you have purchased, it can only be used in areas where the power supply voltage is the same as that of the unit.



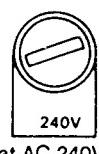
at AC 110V



at AC 120V



at AC 220V



at AC 240V

### 3. Procedures for replacement of flat packaged ICs

#### 1. Tools to be used:

- (1) **Soldering iron** .... Grounded soldering iron or soldering iron with leak resistance of 10 Mohms or more.

Form of soldering iron's tip:

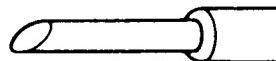


Fig. 2

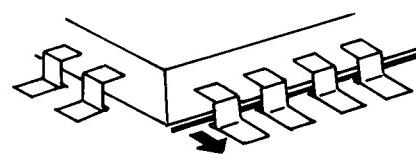
- (2) **Magnifying glass** ... for checking of finished works  
 (3) **Tweezers** .... for handling of IC and forming of leads  
 (4) **Grounding ring** .... Countermeasure for electrostatic breakdown  
 (5) **Nipper** .... for removing defective IC  
 (6) **Small brush** .... for application of flux  
 (7) **Enamel line**

#### 2. Work Procedures:

- (1) **Remove the defective IC**

Cut all leads of the defective IC one by one using a nipper and remove the IC.

1. An enamel line has been pierced between the legs of the flat package IC.
2. Use a soldering iron to unsolder the legs one at a time.
3. Repeat the procedure of 1 and 2 above for the 3 sides only.



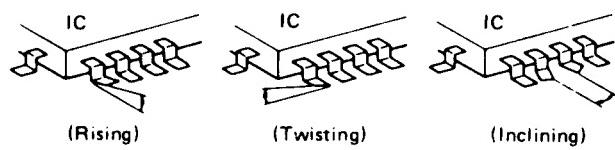
While holding the soldering against the enamel line, pull in the direction of the arrow.

- (2) **Clean the pattern surface of the PC board.**

Get rid of the remaining leads and solder.

- (3) **Check and form the leads of the new flat packaged IC to be installed.**

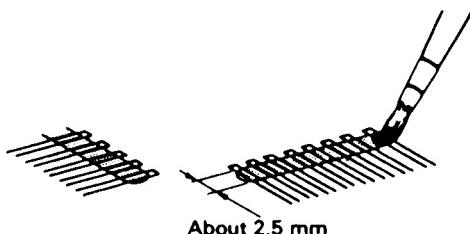
From every lead on the new IC using a pair of tweezers, so that all of them are aligned neatly without being risen, twisted or inclined toward one side. Especially the rising portion of every lead must be formed with greatest care.



**(4) Apply flux to the PC board.**

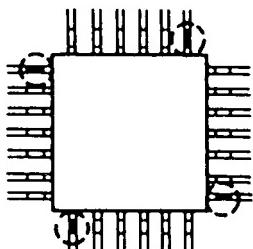
Apply flux to the pattern surface of the PC board which has been cleaned, as shown in the illustration. The area to be applied with flux is the portion of about 2.5mm in width where the IC's leads are to be soldered.

Be careful to apply minimum amount of flux required so as not to smear it on unwanted areas.



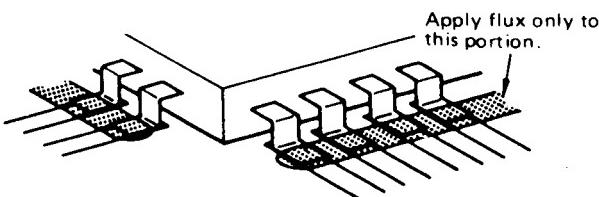
**(5) Temporarily tighten the IC**

Carefully align the pattern and IC's leads, so that the IC will be temporarily tightened to the pattern on the four leads at the corners. At this time, soldering is required, but no need to apply soldering material.



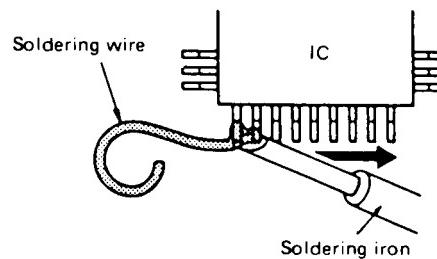
**(6) Apply flux to IC's leads**

Apply flux to the areas of IC's leads where soldering is to be performed. Be careful not to smear flux on the root portion of any lead or the body of IC.



**(7) Soldering**

While attaching the tip of the soldering iron to the soldering point as shown in the illustration, feed 2 -5mm of soldering wire. Then, slowly move the iron in the direction indicated by the arrow in the illustration, so that the leads will be soldered to the pattern. Move the iron in the rate of approximately 1cm in 5sec. Proceed with your work while confirming a clean fillet of solder is formed on each lead, subsequent to the melting of flux.



**CAUTION**

- 1) If you move the iron too quickly, loose soldering is likely to result.
- 2) Be especially careful when soldering the first lead where loose soldering is most liable to be formed.

**(8) Check the results**

When soldering of all leads is finished, check the soldered portion on every lead with a magnifying glass. A tester must not be used or checking of any soldered position

**3. Safety-check out (U.S.A. model)**

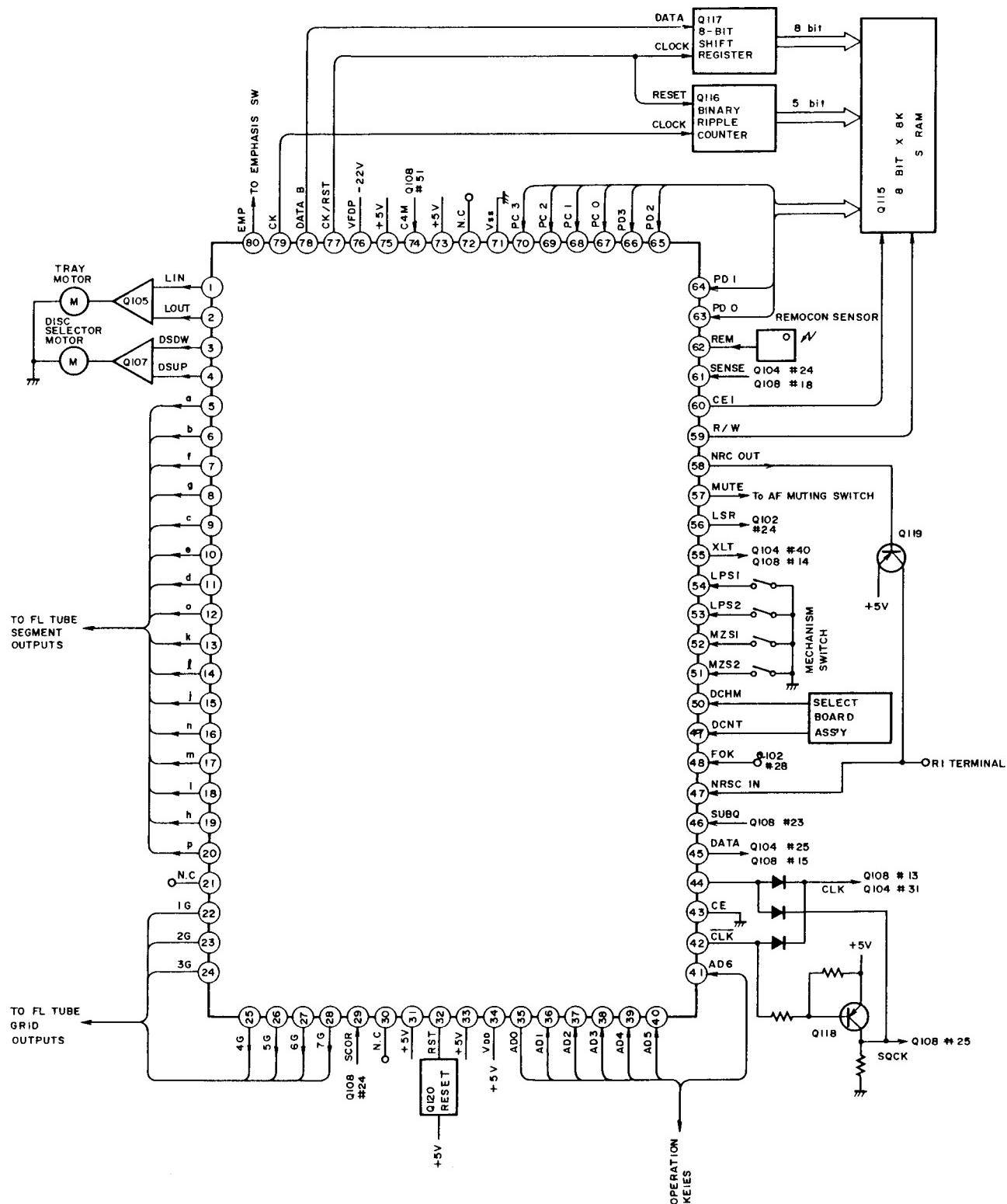
After correcting the original service problem, perform the following safety check before releasing the set to the customer:

Connect the insulating-resistance tester between the plug of power supply cable and chassis.

Specifications: more than 10Mohm at 500V.

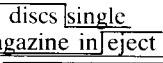
# MICROPROCESSOR DESCRIPTIONS

CXP50116H-105Q



CONNECTION DIAGRAM

**Q114**  
**CXP50116H-105Q (Microprocessor) Terminal Description**

Pin No.	Symbol	Descriptions
1 2	LIN LOUT	Disc tray loading IN/OUT output terminals. <u>Brake</u>  IN
3 4	DSDW DSUP	Disc selector UP/DOWN output terminals.   Brake
5~20	a~p	Segment output terminals for FL tube.
22~28	1G~7G	Digit output terminals for FL tube.
29	SCOR	Subcode sync. SO+SI input terminal. 
32	RST	Reset input terminal.
34	V <sub>DD</sub>	Power supply terminal. Connect to 5V.
35~41	AD0~AD6	Key matrix input terminals. (A/D converter)
42 44	CLK	Serial clock output terminal. Subcode clock output terminal.
45	DATA	LSI control data serial output terminal.
46	SUBQ	Subcode Q data serial input terminal.
47	NRSC IN	RI code (Remote control code) input.
48	FOK	Focus OK input terminal.  
49	DCNT	Disc count pulse input terminal. 
50	DCMH	Disc selector home switch input. 
51 52	MZS2 MZS1	Magazine discrimination switch input terminals. 
53 54	LPS2 LPS1	Load position switch input.  
55	XLT	LSI control data latch pulse output.
56	LSR	Laser diode ON/OFF output terminal. 
57	MUTE	Audio muting output terminal. 
58	NRC OUT	RI code output terminal.
59	R/W	Read/Write command output terminal for Q115.
60	CE1	Chip enable
61	SENSE	LSI operation input terminal.
62	REM	Remote control code input terminal.
63~70	PD0~3, PC0~3	Memory data input/output terminals.
71	V <sub>SS</sub>	Connect to GND terminal.
74	C4M	Clock input terminal.
76	VFDP	Power supply terminal for predriver.
77	CK/RST	Clock/Reset output terminal.
78	DATA B	Data output terminal.
79	CK	Clock output terminal.
80	EMP	De-emphasis ON/OFF output. 

# ADJUSTMENT PROCEDURES

## Instruments Required

Dual trace oscilloscope, Frequency counter, AF signal generator, Test disc (SONY YEDS-18), AC voltmeter, Jitter meter, and Socket P4 (Part no. 25050138)

### 1. VCO Frequency Adjustment

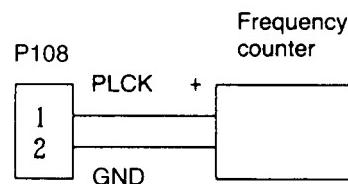
Connect the frequency counter to terminal P110.

Turn the power switch to ON. (No load the disc.)

Adjust R154 so that the frequency counter reading becomes  $4322 \pm 5\text{kHz}$ .

After adjustment, disconnect the frequency counter.

Mode: STOP

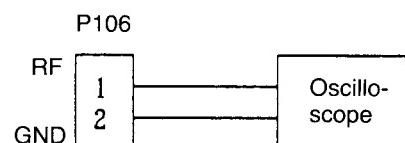
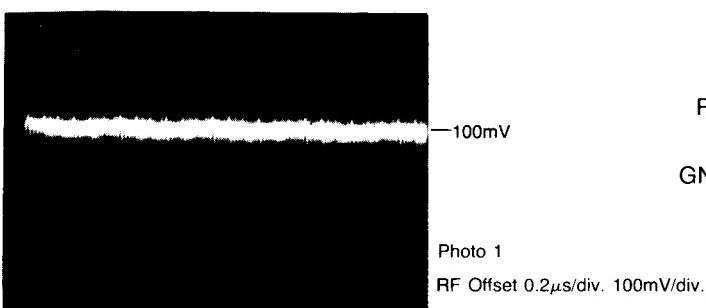


### 2. RF Offset Adjustment

Connect the oscilloscope to terminal P106.

Adjust R192 so that the RF signal becomes  $100\text{mV} \pm 30\text{mV}$ .

Mode: STOP



### 3. Tracking Balance Adjustment

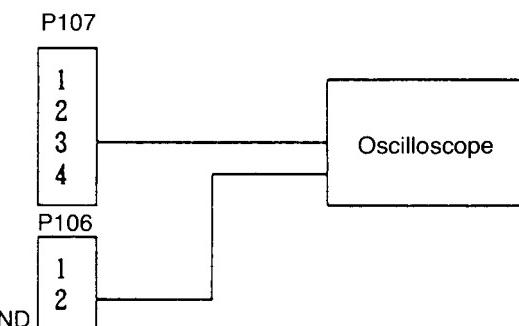
Turn R108 clockwise  $45^\circ$  from the mechanical center.

Connect the oscilloscope to terminal P107 TR.

Adjust R195 so that the TR signal becomes  $0 \pm 30\text{mV}$ .

Turn R108 to the mechanical center.

Mode: STOP



### 4. Focus Offset Adjustment

Load the test disc YEDS-18 on the tray and play the track 2.

Connect the oscilloscope or jitter meter to terminal P106.

(Oscilloscope)

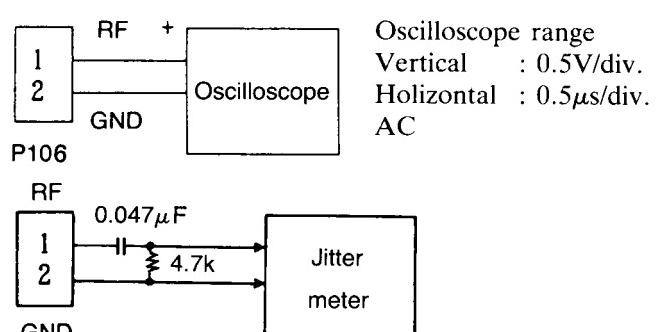
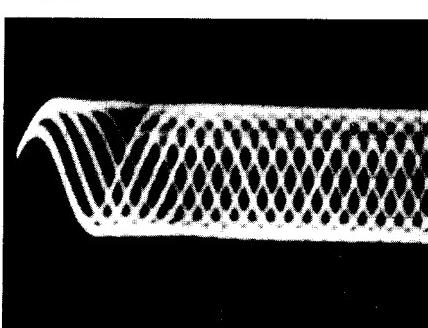
Adjust R110 until a clear trace of waveform pattern as shown photo 1 appear on the oscilloscope.

When the amount of jitter is broad, set R110 to mechanical center.

(Jitter meter)

Adjust R110 until the jitter meter reading becomes minimum. (Less than 10ns.)

After adjustment, disconnect the oscilloscope or jitter meter.



## 5. Tracking Offset Adjustment

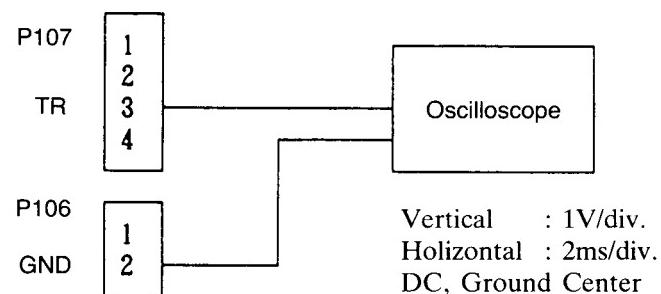
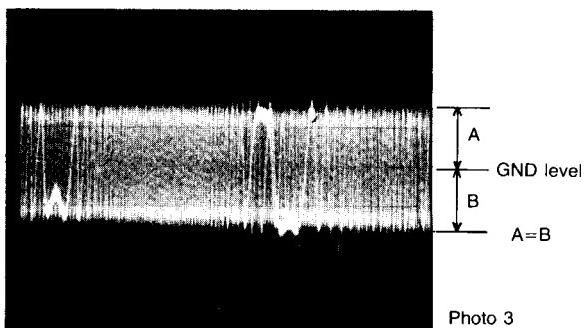
Load the test disc YEDS-18 on the tray and play the track 2. Turn R132 to minimum position. (Counter clockwise)

Connect the oscilloscope between pin 3 (TR) of P107 and pin 2 (GND) of P106.

Adjust R108 until the center of tracking error signal on the oscilloscope becomes GND level.

Turn R132 to the mechanical center.

After adjustment, disconnect the oscilloscope.

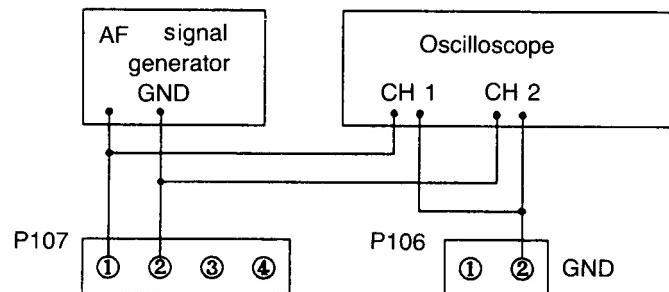
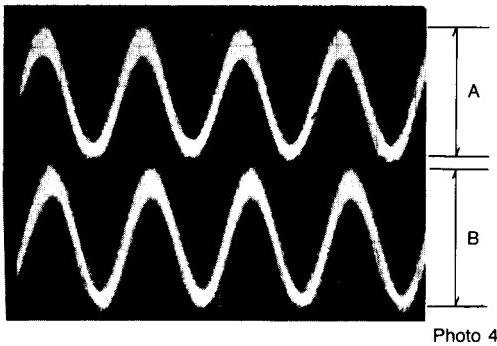


## 6. Focus Gain Adjustment

Set the output of AF signal generator to 800Hz, 1~1.5Vp-p.

Play the track 2 of test disc.

Connect the oscilloscope and the AF signal generator as shown below.



Adjust R122 until 800Hz components of channels 1 and 2 on oscilloscope become same level.

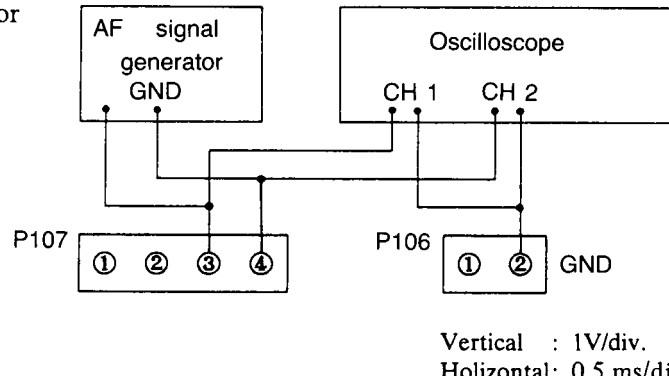
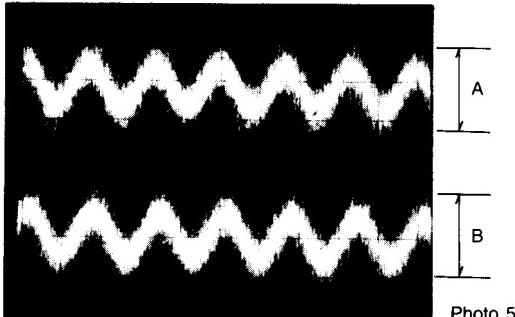
After adjustment, disconnect the AF signal generator and the oscilloscope.

## 7. Tracking Gain Adjustment

Set the output of AF signal generator to 1.2kHz, 1~1.5Vp-p.

Play the track 2 of test disc.

Connect the oscilloscope and the AF signal generator oscillator as shown below.



Adjust R125 until 1.2kHz components of channels 1 and 2 on oscilloscope become same level.

After adjustment, disconnect the AF signal generator and the oscilloscope.

After adjustment, confirm that the center of tracking error signal becomes GND level.

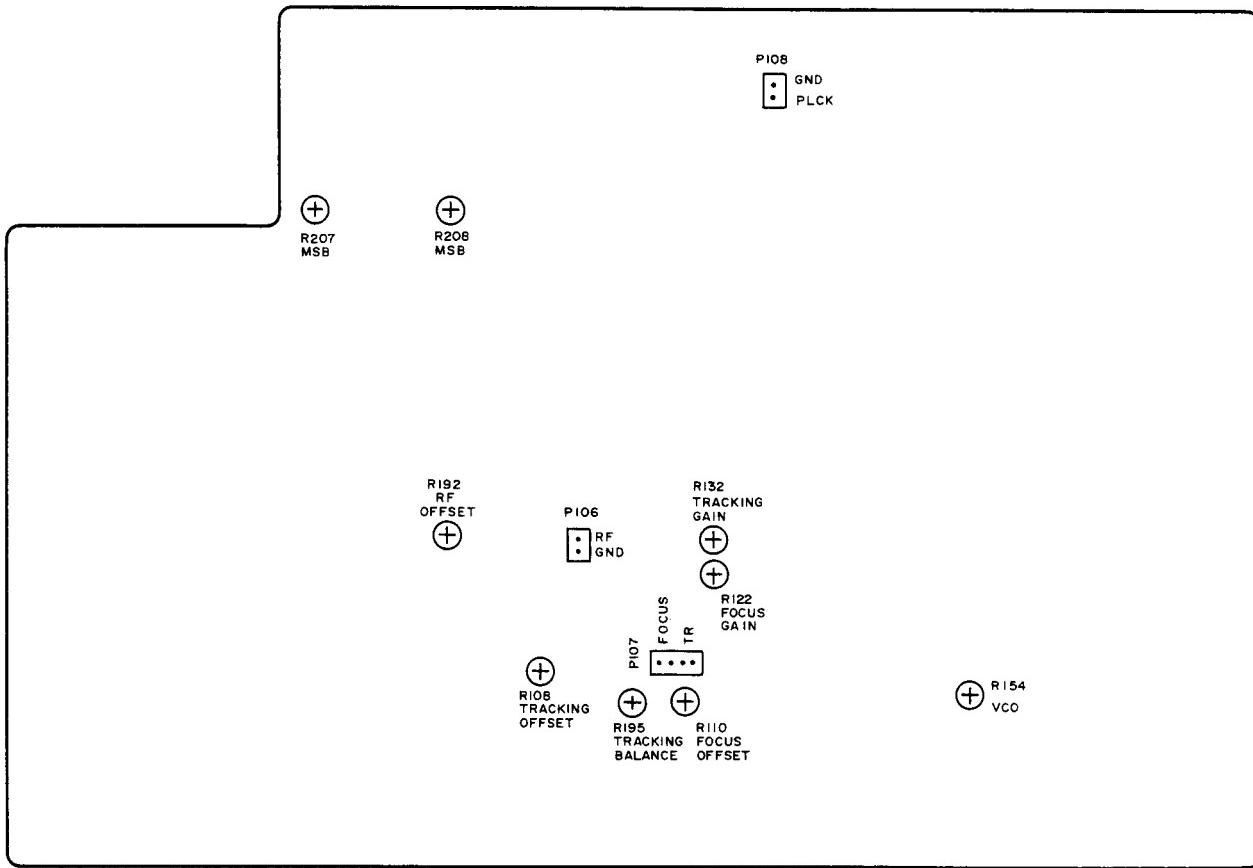
## 8. Audio circuit adjustment

Connect the AC voltmeter to output terminal of left channel (right channel).

Load the test disc and play the track 2.

Next, play the track 17.

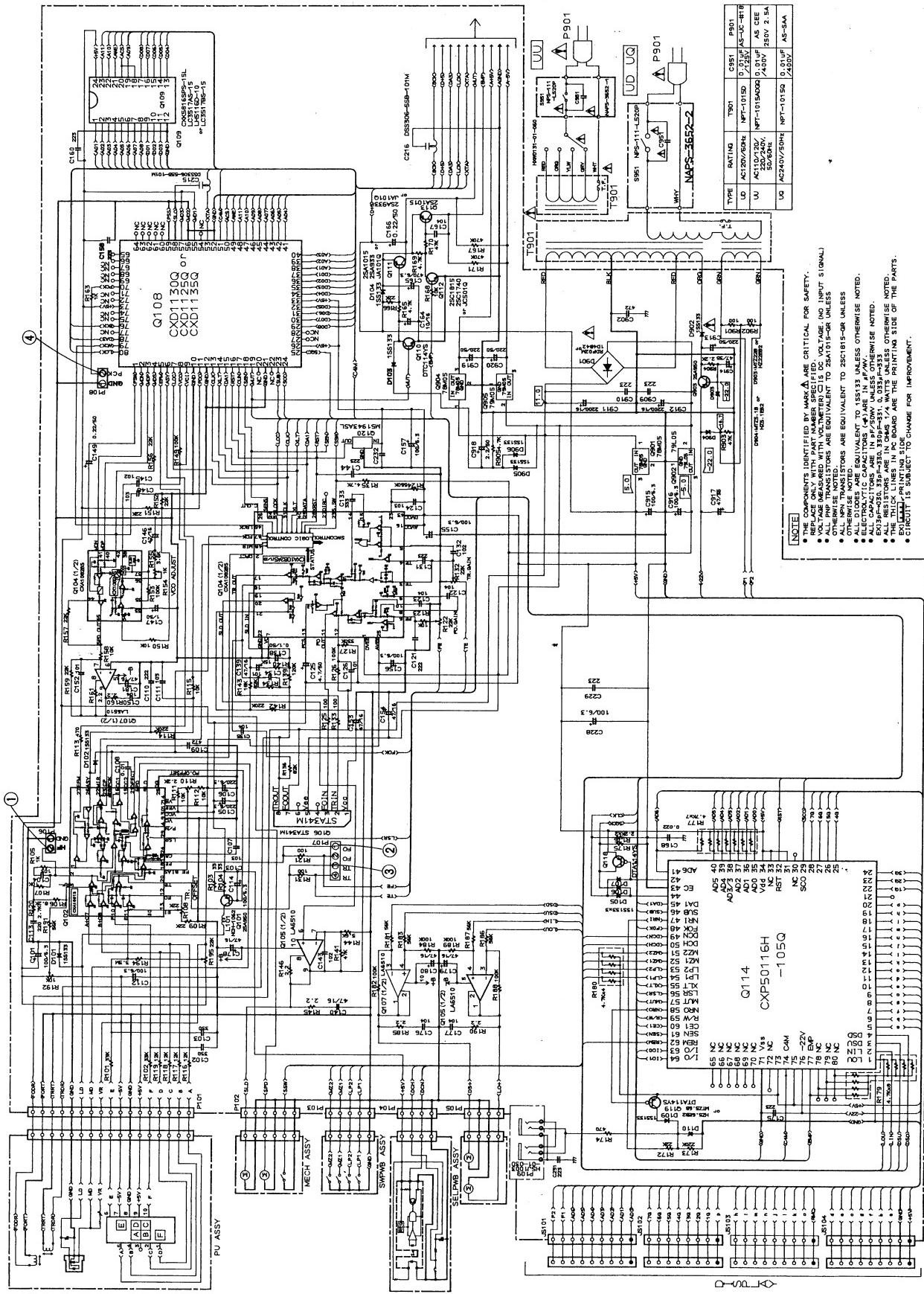
Adjust R207 (R208) so that the output discrepancy between track 2 and track 17 is  $60 \pm 0.25\text{dB}$ .



ADJUSTMENT POINT

## Schematic Diagram A

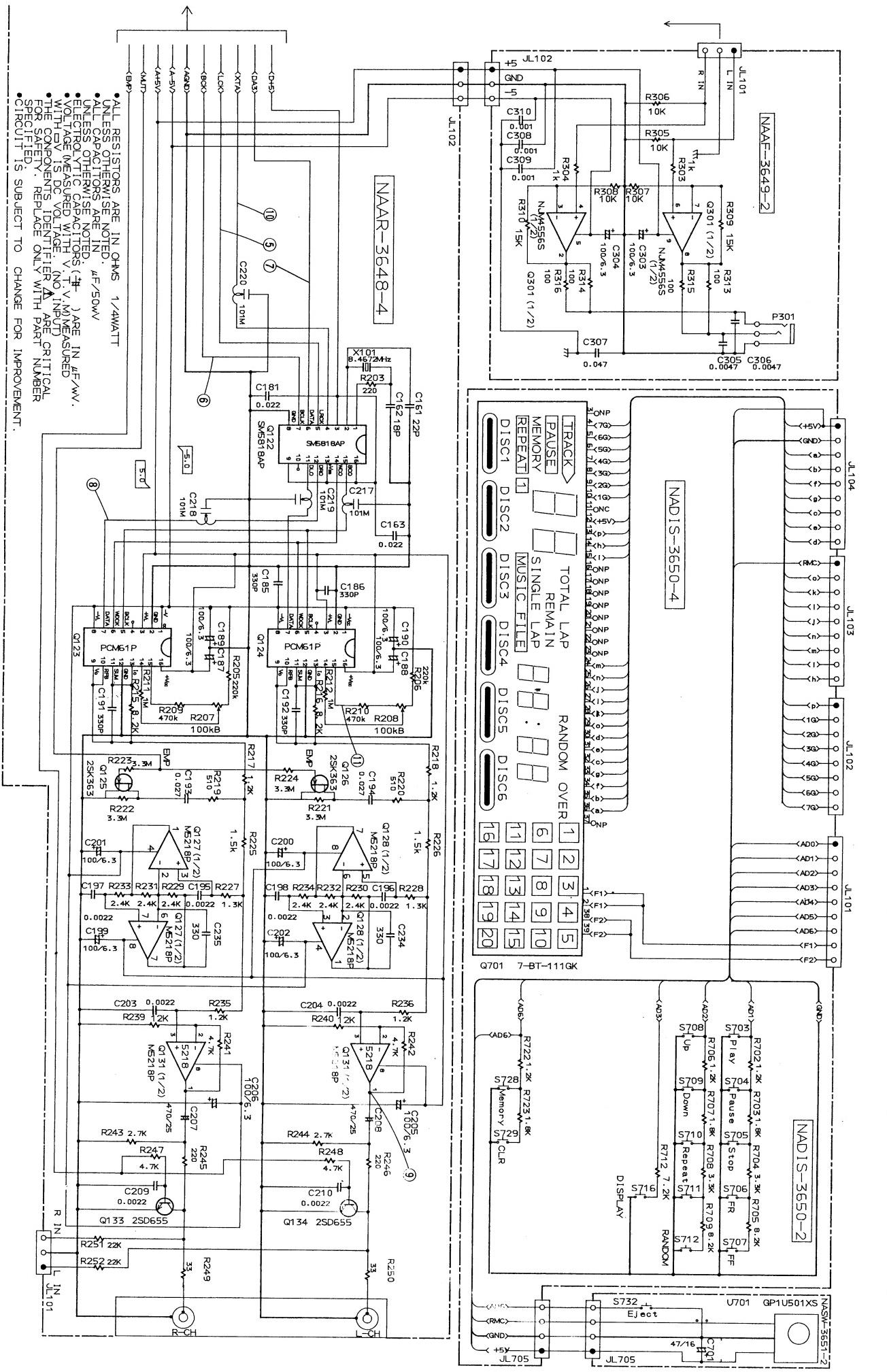
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**ALL CONVENTIONAL AND INNOVATIVE CONSTITUENTS IDENTIFIED BY MARK ↑ ARE CRITICAL FOR SAFETY**

# CHEMATIC DIAGRAM

**DX-C310**      **DX-C510**



**MAIN CIRCUIT PC BOARD (NAAR-3648-4)**

CIRCUIT NO.	PART NO.	DESCRIPTION	CIRCUIT NO.	PART NO.	DESCRIPTION			
<b>ICs</b>								
Q102	22240180	CXA1081S	Q901	222780052	78M05			
Q104	22240263	CXA1082BS	Q902	222790053	79L05			
Q105, Q107	22240034	LA6510	Q904	222780055MIT	M5F78M05			
Q106	22240168	STA341M-L	Q905	222790055MIT	M5F79M05			
Q108	22240095	CXD1130Q	<b>Transistors</b>					
Q109	22240178, 22240118, 22240234 or 22240255	CXK5816SPS-15L, LC3517AS-15, LC3517BS-15 or LH5116D-10	Q101, Q903	2211503 or 2211504	2SA950-O or 2SA950-Y			
Q114	22240306	CXP50116H-105Q	Q110	221281	DTC114YS			
Q120	22240018	M51943ASL	Q111, Q113	2211454, 2211455, 2213074 or 2212495	2SA1015-Y, 2SA1015-GR, 2SA933-R or JA101-Q			
Q122	22240362	SM5818AP	Q112	2211254, 2211255, 2211183 or 2212485	2SC1815-Y, 2SC1815-GR, 2SC1740-R or JC501-Q			
Q123, Q124	22240324	PCM61P	Q118, Q119	2213090	DTA114YS			
Q127, Q128	222808 or Q131	M5218P or M5218AP	Q125, Q126	2212524 or 2212525	2SK363-GR or 2SK363-BL			
	22240369		Q133, Q134	2211705 or 2211706	2SD655-E or 2SD655-F			
<b>Diodes</b>								
D101-D107	223163	1SS133						
D109, D902	223163	1SS133						
D110	224650562 or 224450562	HZ5.6EB2 or MTZ5.6B						
D901	22380013 or 22380039	RDF02M or ID4B42						

CIRCUIT NO.	PART NO.	DESCRIPTION	CIRCUIT NO.	PART NO.	DESCRIPTION
D903	224652202 or 224452202	HZ22EB2 or MTZ22B	C149	354782299	0.22 $\mu$ F, 50V, Elect.
D904	224650512 or 224450512	HZ5.1EB2 or MTZ5.1B	C150	371121044	0.1 $\mu$ F 5%, 50V, Mylar
D905, D906	223163	ISS133	C153, C154	354744709	47 $\mu$ F, 16V, Elect.
	<b>X'tal</b>		C155-C157	354721019	100 $\mu$ F, 6.3V, Elect.
X101	3010153	KD3913FFA	C159	354721019	100 $\mu$ F, 6.3V, Elect.
	<b>Coil</b>		C164	354741009	10 $\mu$ F, 16V, Elect.
L101	231023	NCH-1062	C165	354724719	470 $\mu$ F, 6.3V, Elect.
	<b>Capacitors</b>		C166	354782299	0.22 $\mu$ F, 50V, Elect.
C101	354721019	100 $\mu$ F, 6.3V, Elect.	C167	371121034	0.01 $\mu$ F 5%, 50V, Mylar
C104	371121034	0.01 $\mu$ F 5%, 50V, Mylar	C176, C177	371121044	0.1 $\mu$ F 5%, 50V, Mylar
C105, C106	354721019	100 $\mu$ F, 6.3V, Elect.	C178-C181	354744709	47 $\mu$ F, 16V, Elect.
C107, C108	371121034	0.01 $\mu$ F 5%, 50V, Mylar	C187-C190	354722219	220 $\mu$ F, 6.3V, Elect.
C109	371124724	4700pF 5%, 50V, Mylar	C191, C192	373303314	330pF 5%, 125V, Plastic (PP)
C110	371126824	6800pF 5%, 50V, Mylar	C193, C194	371122734	0.027 $\mu$ F 5%, 50V, Mylar
C111	371121034	0.01 $\mu$ F 5%, 50V, Mylar	C195-C198	371122224	2200pF 5%, 50V, Mylar
C112, C114	354721019	100 $\mu$ F, 6.3V, Elect.	C199-C202	354721019	100 $\mu$ F, 6.3V, Elect.
C121	371122224	2200pF 5%, 50V, Mylar	C203, C204	371122224	2200pF 5%, 50V, Mylar
C122, C123	371121044	0.1 $\mu$ F 5%, 50V, Mylar	C205, C206	354742219	220 $\mu$ F, 16V, Elect.
C124	371121034	0.01 $\mu$ F 5%, 50V, Mylar	C207, C208	354782219	220 $\mu$ F, 50V, Elect.
C125	354780479	4.7 $\mu$ F, 50V, Elect.	C209, C210	371122224	2200pF 5%, 50V, Mylar
C131	371122234	0.022 $\mu$ F 5%, 50V, Mylar	C228	354721019	100 $\mu$ F, 6.3V, Elect.
C132	371121024	1000pF 5%, 50V, Mylar	C911, C912	354742229	2200 $\mu$ F, 16V, Elect.
C133	371123334	0.033 $\mu$ F 5%, 50V, Mylar	C913	354782219	220 $\mu$ F, 50V, Elect.
C135	371121044	0.1 $\mu$ F 5%, 50V, Mylar	C914, C917	354764709	47 $\mu$ F, 35V, Elect.
C138	354781099	0.1 $\mu$ F, 50V, Elect.	C915, C916	354721019	100 $\mu$ F, 6.3V, Elect.
C139	354744709	47 $\mu$ F, 16V, Elect.	C918	354780229	2.2 $\mu$ F, 50V, Elect.
C140	352944706	47 $\mu$ F, 16V, Non-polar elect.	C919, C920	354754719	470 $\mu$ F, 25V, Elect.
C143	371121024	1000pF 5%, 50V, Mylar			
C146	354744709	47 $\mu$ F, 16V, Elect.			
C147	354780109	1 $\mu$ F, 50V, Elect.			
C148	371121034	0.01 $\mu$ F 5%, 50V, Mylar			

**DISPLAY CIRCUIT PC BOARD(NADIS-3650-4)**

CIRCUIT NO.	PART NO.	DESCRIPTION
	<b>Filters</b>	
C215-C220	3030002	DSS306-55B-101M
	<b>Resistors</b>	
R108, R195	5210066	N06HR22KBD, Semi-fixed
R110	5210060	N06HR2.2KBD, Semi-fixed
R122, R132	5210066	N06HR22KBD, Semi-fixed
R154	5210058	N06HR1KBD, Semi-fixed
R177	49121472407	4.7kohm × 7, 1/8W, Network
R179	49163472408	4.7kohm × 8, 1/10W, Network
R180	49121472404	4.7kohm × 4, 1/8W, Network
R192	5210064 or 5210217	N06HR10KBD, Semi-fixed
R207, R208	5210070 or 5210221	N06HR100KBD, Semi-fixed
	<b>Plugs</b>	
P102	25055426	NPLG-6P408
P103	25055149	NPLG-5P133
P104	25055148	NPLG-4P132
P105	25055424	NPLG-4P406
P106, P108	25055038	NPLG-2P29
P107	25055045	NPLG-4P33
	<b>Terminals</b>	
P109	25045172	HSJ1003-01-020, RI output/input
P110	25045259	NPJ-2PDBL128, Output
	<b>Sockets</b>	
P101	25050360 or 25050480	NSCT-17P187 or NSCT-17P303
JS101, JS103	25050273	NSCT-9P101
JS104	25050273	NSCT-9P101
JS102	25050272	NSCT-8P100
	<b>Radiator</b>	
	27160176	RAD56
	<b>Screw</b>	
	82143006	3P+6FN(BC), Pan head

**HEADPHONE AMPLIFIER PC BORAD (NAAF-3649-4)**

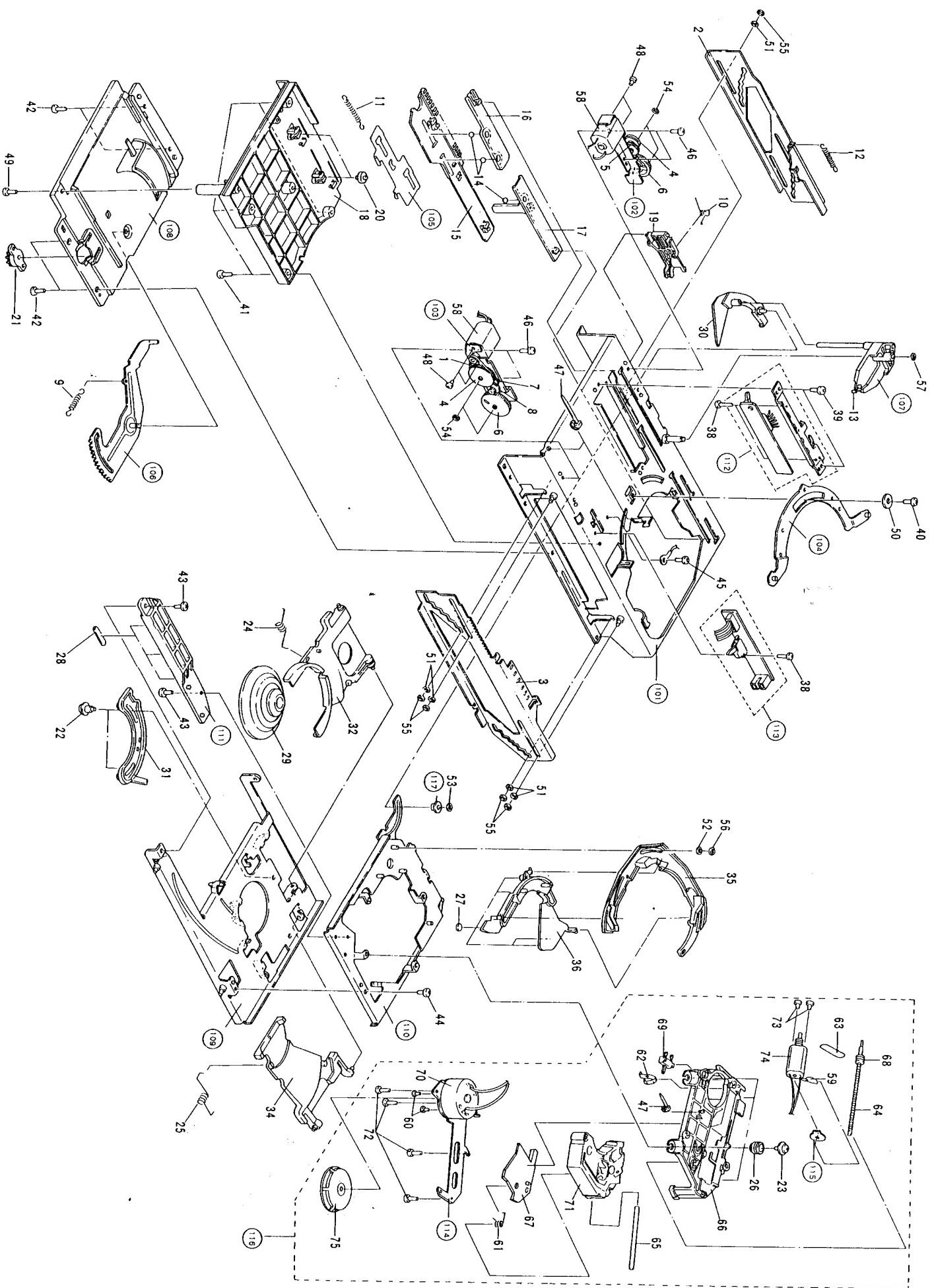
CIRCUIT NO.	PART NO.	DESCRIPTION
	<b>IC</b>	
Q301	222887	NJM4556S
	<b>Capacitors</b>	
C303, C304	354721019	100 $\mu$ F, 6.3V, Elect.
	<b>Jack</b>	
P301	25045256	YKB21-5010

NOTE: THE COMPONENTS IDENTIFIED BY MARK  ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK REPLACE ONLY WITH PART NUMBER SPECIFIED.

## PARTS LIST

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
1	24602505	Belt	69	25065376	Slide switch (INSIDE)
2	24506795	Stair L	70	24506840	Spindle motor
3	24506796	Stair R	71	24506841	Pickup ass'y
4	24506797	Gear pulley	72	801423	Screw
5	24506798	Gear	73	82112003	2P+3F, Pan head screw
6	24506799	Gear	74	24506842	Carriage motor
7	24506800	Gear	75	24506843	Disc table ass'y
8	24506801	Idler gear	101	24506845	Main chassis
9	24503167	Spring, eject	102	24506846	Gear bracket L
10	24503168	Spring, lock	103	24506847	Gear bracket R
11	24503169	Spring SM	104	24506848	Lever
12	24503170	Spring, stair	105	24506849	Select SM
13	24503171	Spring, drive	106	24506850	Eject lever
14	24506807	Steelball	107	24506851	Drive lever
15	24506808	Rack	108	24506852	Bottom guide
16	24506809	Drive plate	109	24506853	Sub chassis
17	24506810	Operation plate	110	24506854	Upper chassis
18	24506811	Top guide	111	24506855	Upper guide
19	24506812	Lock lever	112	24506856	Switch pc board ass'y
20	24506813	Idler roller	113	24506857	Select pc board ass'y
21	24506814	Damper ass'y	114	24506858	Base pc board
22	801419	Motor mounting screw	115	24506859	Carriage motor ass'y
23	801420	Float screw	116	24506860	Servo mechanism ass'y
24	24503172	Clamper spring T	117	24506861	Roller
25	24503173	Clamper spring B			
26	24509400	Float rubber			
27	28140978	Cushion A			
28	28140979	Cushion B			
29	24506822	Clamper			
30	24506823	Rotary lever			
31	24506824	Clamper cam			
32	24506825	Clamper holder T			
34	24506826	Clamper holder B			
35	24506827	Pressure cam			
36	24506828	Upper tray			
38	838120088	2TTB+8B, Pan head screw			
39	801421	3TTB+6B(BC), Pan head screw			
40	838130068	3TTB+6B, Tapping screw			
41	838130068	3TTB+6B, Tapping screw			
42	838130068	3TTB+6B, Tapping screw			
43	838130068	3TTB+6B, Tapping screw			
44	838130068	3TTB+6B, Tapping screw			
45	838130068	3TTB+6B, Tapping screw			
46	833130049	3TTP+4C, Tapping screw			
47	260208	Binder			
48	82112003	2P+3F, Pan head screw			
49	833130080	3TTP+8P, Tapping screw			
50	8771301210	W3×12, Washer			
51	870085	Washer			
52	870085	Washer			
53	27270295	Washer			
54	27270132	Washer			
55	27270294	Washer			
56	27270294	Washer			
57	27270296	Washer			
58	24506829	Motor ass'y (LOADING/DISC SELECT)			
59	335011047	0.1 μF, 25V, Ceramic capacitor			
60	801422	Screw			
61	24503174	Drive spring			
62	24503175	Spring			
63	24602506	Belt			
64	24506834	Drive screw			
65	24506835	Guide bar			
66	24506836	Chassis			
67	24506837	Carriage plate			
68	24506838	Pulley			

MECHANISM-EXPLODED VIEW



## PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
1	27110577A	Front bracket ass'y	U1	IH128548-4	NAAR-3648-4, Main circuit pc board ass'y
2	27100196A	Chassis	U2	IH128549-4	NAAF-3649-4, Headphone amplifier pc board ass'y
3	27130586	Bracket, center	U3	IH128550-4	NADIS-3650-4, Display circuit pc board ass'y
4	27130587	Bracket F	U4	IH128551-4	NASW-3651-4, Remocon sensor terminal pc board ass'y
5	27141345	Bracket PC	U5	IH128552-4	NAPS-3652-4, Power supply circuit pc board ass'y
10	27121363	Back panel <D>	Z1	24506789 260208	NCD-100P-Pic, Mechanism ass'y Binder
	27121363-1	Back panel <W>			
	27121363-2	Back panel <Q>			
12	27190470	KGLS-18S, Holder			
13	27190724	KGPS-12S, Holder			
15	27300750	△ Bushing(strainrelief)			
20	834430068	3TTTS+6B(BC), Tapping screw			
21	834430088	3TTTS+8B(BC), Tapping screw			
22	831130088	3TTW+8B, Tapping screw			
23	830440069	4TTC+6C(BC), Tapping screw			
24	834430108	3TTTS+10B(BC), Tapping screw			
25	833426060	2.6TTP+6P(BC), Tapping screw			
26	833430080	3TTP+8P(BC), Tapping screw			
27	27273123A	Joint, power			
28	27255004	CS-1U, Clip			
29	27150284	Shield plate (Mechanism)			
31	28184445A	Top cover			
32	834430088	3TTTS+8B(BC), Tapping screw			
33	28140720	Cushion			
51	IH128121	Front panel ass'y			
55	833430080	3TTP+8P(BC), Tapping screw			
61	28191527	Clear plate			
62	28133229	Back plate			
63	27262512	Plate			
65	27175153	Leg			
66	834430088	3TTTS+8B(BC), Tapping screw			
72	29366807	Label DANGER			
81	27141090A	Bracket U <W>			
82	834430088	3TTTS+8B(BC), Tapping screw <W>			
P901	253112A	△ AS-UC-4#18, Power supply cord <W>			
		<D>			
		△ AS-CEE,			
		Power supply cord <W>			
		△ AS-SAA, Power supply cord <Q>			
		△ HXW0131-01-060, Voltage selector switch <W>			
S902	253150	TR-23-11-14, Core <D>			
	253118	NK-16N, Clamp <D>			
	25065168	△ NPT-1015D, Power transformer <D>			
L901	230908	△ NPT-1015ADGQ, Power transformer <W>			
L901a	260223	△ NPT-1015Q, Power transformer <Q>			
T901	2300384B				
	2300387B				
	2300386B				

NOTE : THE COMPONENTS IDENTIFIED BY MARK △ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

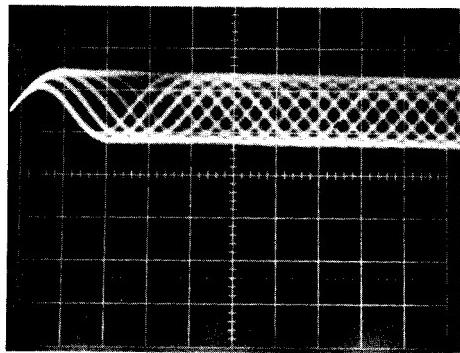
## WAVEFORM OF EACH SECTION

Note: The encircled numbers denote measuring points in the schematic diagram.

Play the track 2 of test disc YEDS-18.

Use the high impedance probe (10:1)

- ① RF signal  
0.5 $\mu$ s/div.  
1V/div.



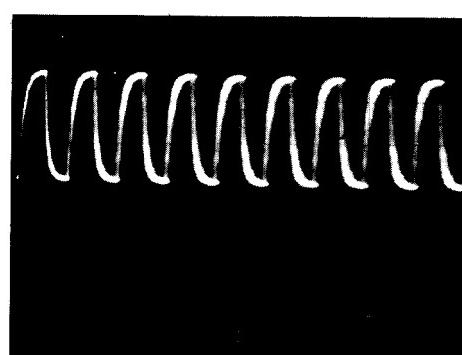
- ② Focus error signal  
5ms/div.  
200mV/div.



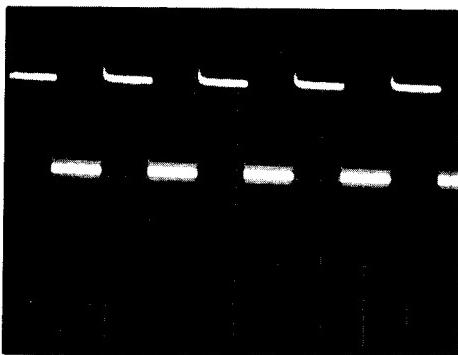
- ③ Tracking error signal  
5ms/div.  
0.5V/div.



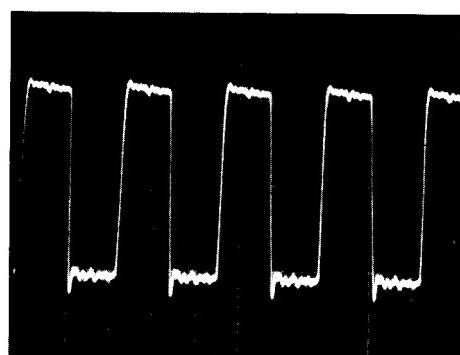
- ④ PLCK  
0.2 $\mu$ s/div.  
2V/div.



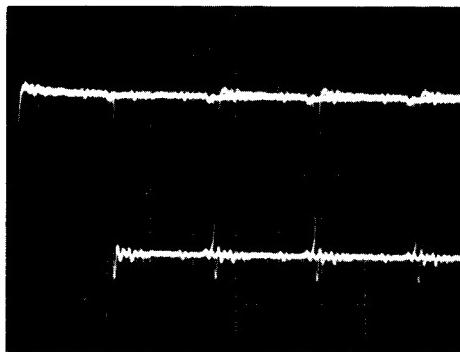
- ⑤ LRCK  
Q122 #5  
10 $\mu$ s/div.  
2V/div.



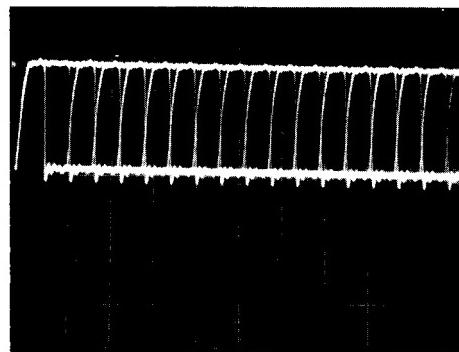
- ⑥ BCLK  
Q122 #7  
0.2 $\mu$ s/div.  
1V/div.



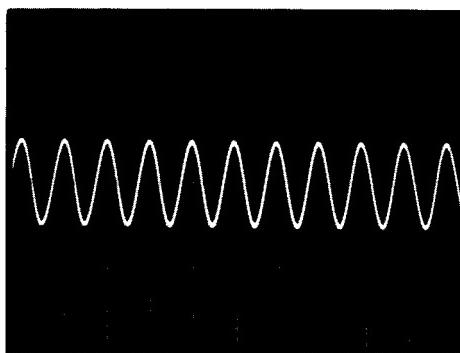
⑦ DATA  
Q122 #6  
 $0.2\mu\text{s}/\text{div}$ .  
1V/div.



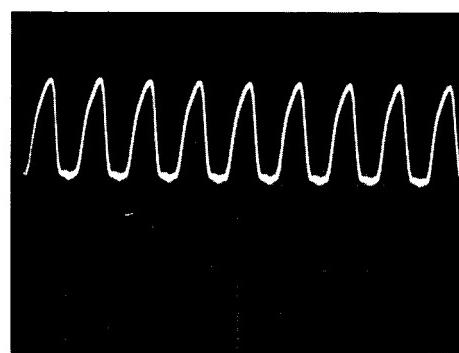
⑧ Q122 #11/#12  
 $0.2\mu\text{s}/\text{div}$ .  
2V/div.



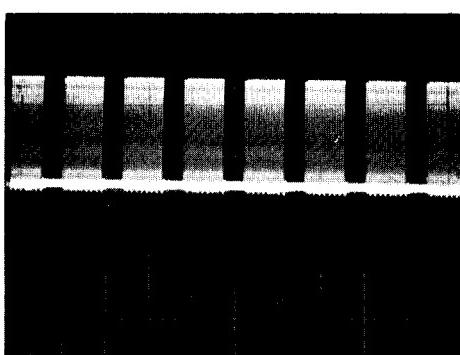
⑨ Q131 #1  
1ms/div.  
2V/div.



⑩ Q122 #4  
 $0.1\mu\text{s}/\text{div}$ .  
2V/div.

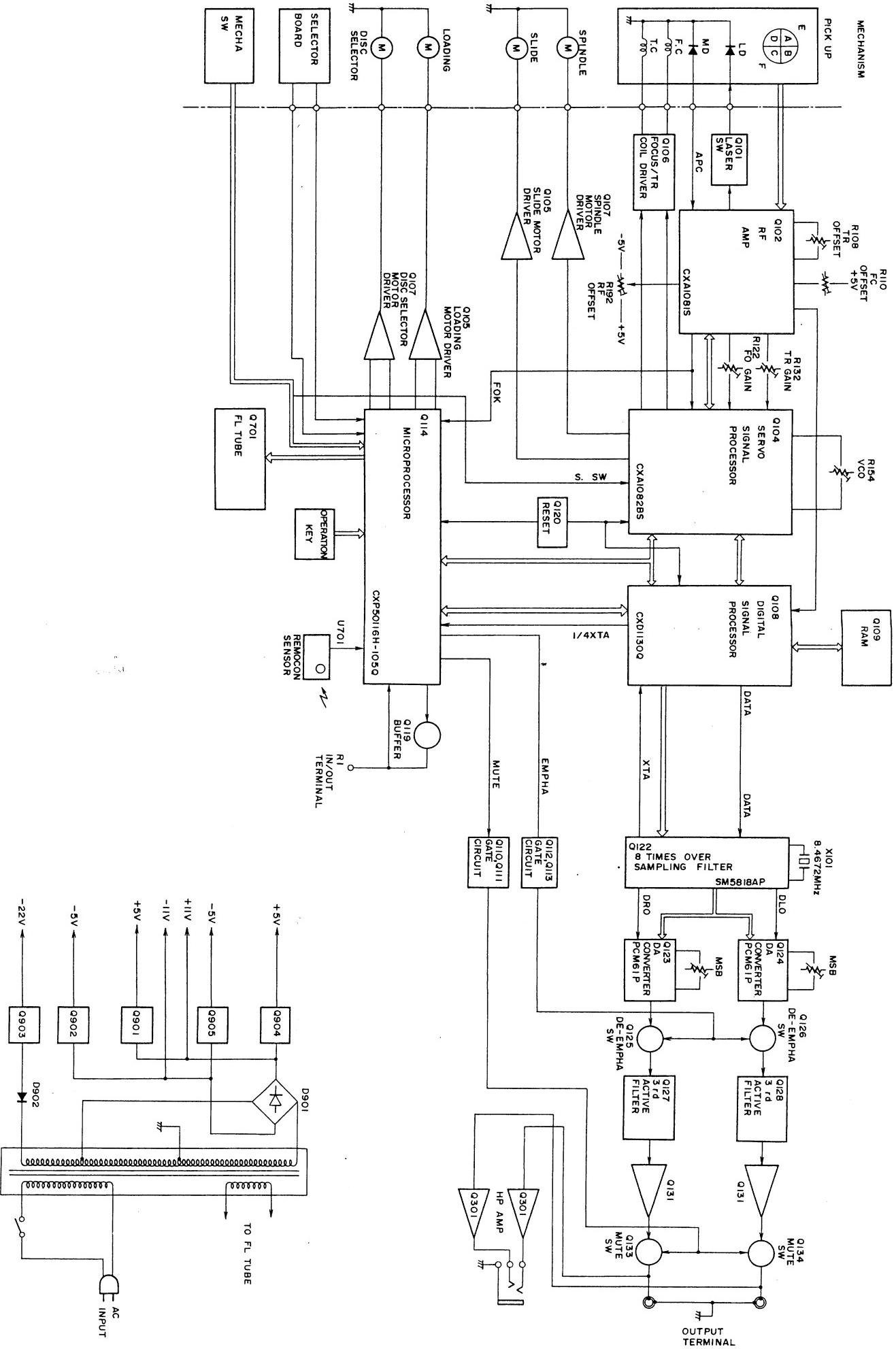


⑪ Q124 #15  
 $2\mu\text{s}/\text{div}$ .  
2V/div.



# BLOCK DIAGRAM

**DX-C310**



# CAUTION ON REPLACEMENT OF PICK-UP

The laser diode in the optical pick-up block is so sensitive to static electricity, surge current and etc. that the components are liable to be broken down or its reliability remarkably deteriorated.

## PRECAUTIONS

### 1. Ground for the work-desk.

Place a conductive sheet such as a sheet of copper (with impedance lower than  $10^6 \Omega$ ) on the work-desk and place the set on the conductive sheet so that the chassis.

### 2. Grounding for the test equipment and tools.

Test equipments and toolings should be grounded in order that their ground level is the same the ground of the power source.

During repair, carefuley take the following precautions.  
(The following precautions are included in the service parts).

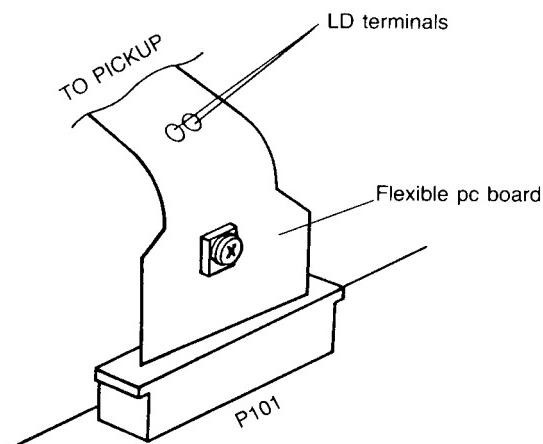
### 3. Grounding for the human body.

Be sure to put on a wrist-strap for grounding whose other end is grounded.

Be particularly careful when the workers wear synthetic fiber clothes, or air is dry.

### 4. Select a soldering iron that permits no leakage and have the tip of the iron well-grounded.

### 5. Do not check the laser diode terminals with the probe of a circuit tester or oscilloscope.



### (Care should be taken with the optical pickup.)

The optical pickup is sensitive to static electricity, surge currents, and other high electrical noise, and because there is the possibility of damage to performance, in the handling of the pickup, the utmost care must be taken, particularly with regard to static electricity.

1. When replacing the optical pickup, first short the LD terminals and remove the connector. Also, when attaching the new optical pickup, after attaching the connector, unsolder the LD terminals.

2. Do not touch the optical pickup object lens with the hands.

# PROTECTION OF EYES FROM LASER BEAM DURING SERVICING

This set employs a laser. Therefore, be sure to follow carefully the instructions below when servicing.

### WARNING!!

WHEN SERVICING, DO NOT APPROACH THE LASER EXIT WITH THE EYE TOO CLOSELY. IN CASE IT IS NECESSARY TO CONFIRM LASER BEAM EMISSION, BE SURE TO OBSERVE FROM A DISTANCE OF MORE THAN 30cm FROM THE SURFACE OF THE OBJECTIVE LENS ON THE OPTICAL PICK-UP BLOCK.

### Laser Diode Properties

- Material: GaAs/GaAlAs
- Wavelength: 780nm
- Emission Duration: continuous
- Laser output: max. 0.5mW\*

\*This output is the value measured at a distance about 1.8mm from the objective lens surface on the Optical Pick-up Block.

# LASER WARNING LABEL

The label shown below are affixed.

## 1. Certification label (120V model)

This label is located on the back panel.

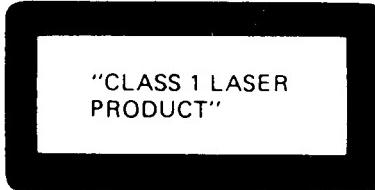
PRODUCT IS CERTIFIED BY THE MANUFACTURER TO COMPLY  
WITH DHHS RULES 21 CFR SUBCHAPTER J APPLICABLE AT THE  
DATE OF MANUFACTURE.



MANUFACTURED

## 2. Class 1 label (Worldwide model)

This label is located on the back panel.



"CLASS 1 LASER  
PRODUCT"

## 3. Warning label

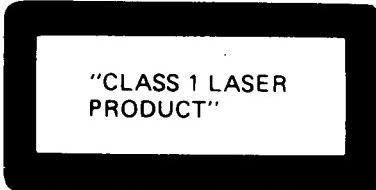
This label is located on the chassis or mechanism.

**DANGER** —INVISIBLE LASER RADIATION  
WHEN OPEN AND INTERLOCK FAILED OR  
DEFEATED. AVOID DIRECT EXPOSURE TO BEAM

**CAUTION** —HAZARDOUS LASER AND  
ELECTROMAGNETIC RADIATION WHEN OPEN  
AND INTERLOCK DEFEATED.

**ATTENTION** —RAYONNEMENT LASER  
ET ELECTROMAGNETIQUE DANGEREUX SI  
OUVERT AVEC L'ECLENCHEMENT DE SECURITE  
ANNULE.

## ADVARSEL

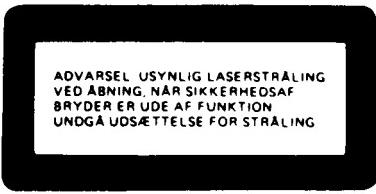


"CLASS 1 LASER  
PRODUCT"

Denne mærkning er anbragt på apparatets højre side og indikerer,  
at apparatet arbejder med laserstråler af klasse 1, hvilket betyder,  
at der anvendes laserstråler af svageste klasse, og at man ikke på  
apparatets yderside kan blive utsat for utiladelig kraftig stråling.

APPARATET BØR KUN ÅBNES AF FAGFOLK MED SÆRLIGT  
KENDSKAB TIL APPARATER MED LASERSTRÅLER!

Indvendigt i apparatet er anbragt den her gengivne advarselsmærkning, som advarer imod at foretage sadanne indgreb i apparatet, at man kan komme til at utsætte sig for laserstråling.



ADVARSEL USYNLIG LASERSTRÅLING  
VED ÅBNING. NÅR SIKKERHEDSAF  
BRYDER ER UDE AF FUNKTION  
UNDGÅ UDSÆTTELSE FOR STRÅLING

VAROITUS! Laite sisältää laserdiordin, joka lähetää (näkymätöntä) silmille vaarallista lasersäteilyä.